

ANALYZING SHORELINE CHANGE

Shoreline change can be calculated through the time-series comparison of various data sets that include ground surveys, aerial photography, satellite imagery, synthetic aperture radar, light detecting and ranging (LiDAR), and global positioning system. Although new satellite and other remotely sensed approaches are becoming feasible (e.g., LiDAR surveys, see Li et al. 2001), aerial photography analysis remains the most commonly used method to calculate shoreline change (Boak and Turner, 2005).

Spatial and temporal errors exist when using aerial photography to calculate shoreline change. Spatial distortion includes tilt, radial distortion, and relief displacement. However, these distortions are generally

corrected when the image is rectified. Rectification gives the image a spatial reference and is necessary before shoreline demarcation. Since aerial photographs are a snapshot in time of a dynamic system, it is important to consider the events occurring just prior to the capture of the image (e.g., storms, flood). Regardless, it is essential to document and understand both the storm-dominated shoreline processes and the chronic change over decadal timescales that reflect net long-term variability.

Evaluating changes in shoreline position using aerial photographs can be quite challenging and time-consuming. Briefly, for a recent study in the Neuse River Estuary funded by NOAA, shoreline change was evaluated using spatially-

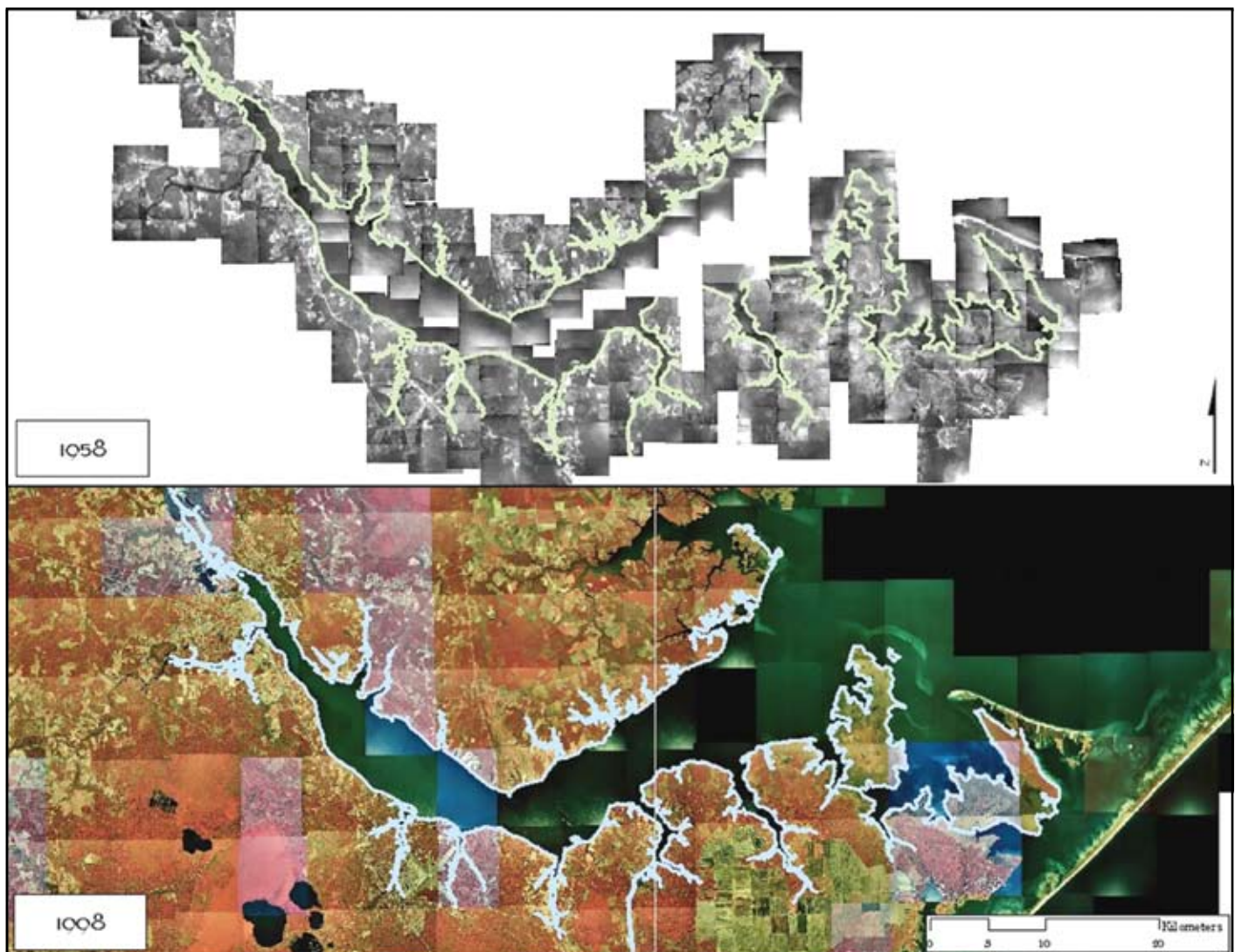


Figure 4. Representation of the areas that have been georectified and the associated digitized shorelines for the 1958 and 1998 aerial photographs of the Neuse River Estuary.